1897.

THIRTY-SECOND
ANNUAL REPORT

TO THE

BATH URBAN SANITARY AUTHORITY,

BY

THE MEDICAL OFFICER OF HEALTH.

"Salus Populi suprema Lex."

BATH:
Printed by J. B. Keene & Co., "Journal" and "Bladud" Works.
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City and County Borough of Bath.

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CITY & COUNTY BOROUGH OF BATH.

HEALTH RESORT AND CHIEF TOWN OF SOMERSETSHIRE.

Situation—Latitude 51° 23′ N; Longitude 2° 21′ W.

Elevation—Varies from 60 feet above sea level on the lower banks of the river to about 550 on either side, the hills rising to about 700 feet not far from the boundaries.

Geological Formation—Oolitic limestones, clays and sands.

Area of the County Borough—3,382 statute acres.

Population—1891 Census, 51,844; 1897, Estimated, 52,600.

Density of Population—Per acre, 15·3; per house, 5·7.

Rateable Value—1891, £298,062.

Assessable Value, 1897, £298,874.

Number of Inhabited Houses—
Census 1891, 8,933; Rate Book, 1897, 9,456.

Rainfall—1897, 33·29 inches; 1896, 23·4 inches.
Average, 1891 to 1895, 30·0 inches.

Birth-Rate—19·2 per 1,000 annually.

Comparative Mortality Figure, 1896, 944; 1897, 887.

Average Death-rate, 1887-96, 18·6 per 1,000 annually.

Crude Death-rate, 1897, 16·4 per 1,000 annually.

Recorded Death-rate reduced to Standard for Age and Sex Distribution, 15·4; corrected for Non-Residents, 14·4.

Death-rate from 7 principal Zymotic diseases, 1·2 per 1,000 annually.

Death-rate from the 6 Zymotic diseases (Diarrhœa excluded), 0·95 per 1,000 annually.

Deaths under 1 year, 129, or 2·45 per 1,000 living of all ages.

Infantile Mortality.—128 per 1,000 Births.

Deaths under 5 years of age, 198, or 3·8 per 1,000 living of all ages.

Young Child Mortality.—43·0 per 1,000 living under 5 (1891).

Deaths over 60 years of age, 372, or 7·07 per 1,000 of all ages.

Senile Mortality.—64·1 per 1,000 living over 60 years of age.

To the Mayor, Aldermen and Councillors of the Bath Urban Sanitary Authority.

GENTLEMEN,

I have the honour of submitting to you the Thirty-second Annual Report on the Sanitary Condition of the City and County of Bath.

My last report was of unusual size because I was asked specially to give complete information concerning the different parishes and the mortal statistics of past years.

The present Report is, as regards Death-rates, generally most favourable. I may refer especially to the Comparative Mortality Figure, 887.

I have followed the instruction of the Local Government Board in reporting my inspections, the advice I have given and the action taken thereon.

For convenience my remarks are arranged under various headings, viz.:—

The Population of Bath.

A correct estimate of the population of a district is necessary for accurate vital and mortal statistics. Unfortunately actual enumeration is the only reliable mode of computation and for a Health Resort even this is only true for the particular Season during which the Census was taken. Our calculations become more and more doubtful every year until a fresh Census.

The following figures represent the population of Bath, as calculated by various methods, for 1891 and 1897 :—

	1891.	1897.
Registrar General's Method	51,090	51,863
Assuming House Density Constant	52,916	53,974
,, Birth Rate ,, ...	45,400	45,711
Natural Increase (Excess of Births over Deaths)	53,532	52,742
Mean of four estimates	50,734	51,073
Actual Enumeration, Census 1891	51,844	

The Birth-rate for 1890 calculated as for a population of 45,400 would have been given as 25 per 1000 annually, whereas with "Natural Increase" as the basis for fixing the population it would have been stated to be 21·8 per 1000 annually.

For the sake of uniformity with the last three Annual Reports I shall take practically the same figures as last year for calculating the General Death-rate and Birth-rate, and consider the population of Bath to be 52,600.

The Crude Death-rate, Corrected Death-rate and Comparative Mortality Figure.

The Crude Death-rate is calculated in terms of deaths from all causes per 1000 persons of all ages and is very little value for the purpose of comparing the sanitary condition of one district with that of another. Crude Death-rate for 1897, 16·4 per 1000 annually.

The Corrected Death-rate is more valuable, the proportion of the various age groups to the general population being considered. The Standard Death-rate must first be ascertained By the Standard Death-rate is meant the Death-rate at all ages, calculated on the hypothesis that the rates of each of the twelve age periods of each sex were the same as in England and Wales during the ten years 1881-90, the Death-rate at all ages in England and Wales during that period having been 19·15 per 1000 annually. The Standard Death-rate for Bath is 20·3. It is purely hypothetical. A Death-rate of 20·3 in Bath would have the same significance as one of 19·15 in England and

Wales. Having the Standard Death-rate, the figure by which the Crude Death-rate should be multiplied, in order to correct for variations in age and sex, is easily found. This “Factor for Correction” for Bath is 0·943.

Our returns shew that in 1897 there were 861 “deaths from all causes,’ but this enumeration includes 61 deaths among persons who only came to Bath in their last illness for treatment; these should be deducted. At the Statutory Hospital there were 5 deaths among persons who went there from Bath for treatment; these were registered as occurring in the Rural District, and should be added. We thus have a total of 805 deaths among persons usually residing in Bath, equivalent to a Death-rate of 15·3 per 1000, which, multiplied by the “Factor” ·943, gives us the corrected Death-rate, 14·4 per 1000 annually. The Death-rate for 1897 is the lowest recorded.

The “Comparative Mortality Figure” represents the Death-rate corrected to standard population, but not corrected for non-residents, compared with the recorded Death-rate at all ages in England and Wales taken as 1000. The Comparative Mortality Figure for Bath for 1897 is 887; that is to say, the same number of living persons, of similar ages and sex, that gave 1000 deaths in England and Wales gave 887 in Bath, including those from other districts who died in our Public Institutions. This is worth recording!

Population of Bath in Age Groups. Age Distribution of 1000 persons compared. Deaths and Death-rate per 1000 each Age Group:—

Age Group.	Standard Population.	Bath Proportion.	Population Total.	Deaths, 1897.	Death-rate per 1000.
Under 5..	123	89	4,605	198	43·00
5 ,, 15..	228	187	9,640	32	3·32
15 ,, 25..	193	209	10,848	33	3·04
25 ,, 35..	151	150	7,781	45	5·78
35 ,, 45..	115	116	6,032	55	9·12
45 ,, 55..	86	98	5,113	77	15·06
55 ,, 65..	57	75	3,901	107	27·43
65 ,, 75..	33	51	2,657	143	53·82
75 ,, 85	14	25	1,084	129	119·00
85 and over			183	42	229·51
All Ages ..	1,000	1,000	51,844	861	16·39

The differences between the populations of England and Wales and of Bath are shown in the 2nd and 3rd columns. Thus in the general population among 1,000 persons 123 would be under 5 years of age and 47 over 65, while in Bath among the same number of persons 89 would be under 5 and 76 over 65 years.

In each age group the Death-rate is slightly below the Death-rate at the same age group for England and Wales for the quinquennium 1891-5. Statistics for a later period are not yet published.

Special Death-rates.

Deaths	under one	per	1,000	of all ages	...	2·45
,,	,,	,,	,,	,,	Births ...	...	128
,,	over sixty	,,		,,	of all ages	...	7·07
,,	,,	,,	,,	,,	over sixty	...	64·07

Causation of Mortality.

In the appendix will be found a tabulated statement of the deaths from all causes in the year 1897, classified according to diseases, ages, and sub-districts. But in noting the prevalence of any particular disease it is also necessary to consider the abnormal constitution of the population as regards age groups, for some diseases are peculiar to certain ages.

The Registrar General publishes the Death-rates for England and Wales from several separate causes at all ages, and at 11 groups of ages for each sex. From these it is possible to calculate the normal number of deaths in any population, however much it may differ, in the relative proportions of the different age groups from the standard ; this has been done in the following table. The first column shows the number of persons who might be expected to die every year in Bath, if the population were of similar constitution as that of England and

Wales and the incidence of fatal disease the same. In the second column correction is made for the larger proportion of females in the Bath population. The third column is fully corrected for age as well as sex, and it is this column which shows the standard number of deaths.

English Death-rates of various diseases for 1881-90, applied to Bath population and compared with actual deaths during various periods 1880-97.

DISEASE.	Standard Deaths.			Actual Deaths.			
	Not Corrected.	Corrected for Sex.	Fully Corrected.	1880 to 91 Mean.	1891 to 95 Mean.	1896	1897
Measles	23	23	16	12·6	9·3	9	11
Scarlet Fever	17	17	13	?	7	8	5
Whooping Cough	23	24	16	11·2	15	1	15
Diphtheria	8	8	6	?	6·8	20	16
Fevers (Typhoid)	12	12	12	5	3	5	3
Diarrhœa Infantile	35	35	29	?	?	28	13
Cancer	31	32	42	53·8	57·4	62	65
Phthisis	89	88	94	88·5	78·2	61	64
Other Tubercular	36	35	27	39	34·6	35	22
Nervous System	134	133	145	158·4	124	136	107
Circulatory System	82	82	110	111·5	123	132	118
Respiratory System	193	190	202	184	176	160	161
Bronchitis	111	110	123	129	111	84	95
Pneumonia	55	54	52	48	58	56	52
Digestive System	57	57	62	50	61	59	47
Urinary System	23	22	27	38	37	32	29
Death from Violence	34	31	32	32	36	35	36
All Causes	989	980	1056	1048	981	921	861

Annual Death-rates per 1,000 from All Causes and from several Zymotic Diseases during the year 1897.

	All causes.	Principal Zymotic Diseases.	Small Pox.	Measles.	Scarlet Fever.	Diphtheria	Whooping Cough.	Fever.	Diarrhœa.	Deaths under 1 per 1000 Births.
England and Wales	17·4	2·15	0·00	0·40	0·14	0·24	0·35	0·16	0·86	156
33 Great Towns	19·1	2·87	0·00	0·55	0·18	0·31	0·41	0·18	1·24	177
Bath	16·4	1·20	—	0·21	0·10	0·30	0·29	0·06	0·25	128
67 Other Large Towns	17·2	2·41	0·00	0·43	0·15	0·24	0·38	0·16	1·05	169
England and Wales less the 100 Towns	16·4	1·62	0·00	0·29	0·12	0·19	0·31	0·14	0·57	138

A careful study of the above tables will, I think, lead to the conclusion that the conditions of life in Bath must be naturally favorable to existence. Exception may be taken to the number of deaths from Cancer. I am of opinion that this exception is apparent rather than real. Owing to the admirable Medical Institutions of Bath, and the great attention which is paid to the sick poor, Cancer is probably more often recognized and treated here than is generally the case. The Registrar-General, in his 58th Annual Report for England and Wales for 1895, dated 1897, says "4·5 per cent. of the total deaths was so unsatisfactorily stated as to be useless for the purposes of scientific classification," (p. xvii). In Bath we are able to classify practically all our deaths.

The calculated numbers of deaths from Cancers at English rates on Bath population are Males 11, Females 31. The observed numbers of deaths in 1896 were Males 20, Females 42, and in 897 Males 21, Females 44. Cancer in man is more often deep-seated and likely to escape observation than in woman. The Registrar-General considers the general increase of Cancer mortality in England and Wales to be to some extent due to the ever-increasing certainty in diagnosis, our figures support this explanation.

Zymotic Mortality.

The total number of deaths from Notifiable Zymotic Disease in the Borough was 21, viz.,—Scarlet Fever 5, Diphtheria and Membranous Croup 15, Enteric Fever 3, Erysipelas 2.

At the Statutory Hospital there were 5 deaths among the Urban cases—Scarlet Fever 4, Diphtheria 1. These are included in the so-called Zymotic Death-rate.

From Non-notifiable Zymotic Diseases there were 55 deaths—Measles 11, Influenza 12, Whooping Cough, 15, Diarrhœa and Gastro-Enteritis 17. Deaths from Influenza are not included in the "Zymotic Death-rate." Deaths from Infantile Diarrhœa are included.

A map of Bath, spotted to show the incidence of fatal zymotic disease year after year, indicates limited localities as infected. Having repeatedly reported the continued prevalence of Diphtheria in one district, and pointed out the insanitary conditions which foster that disease, I will only re-state a few of the most important facts. In 1897 there were 67 notified cases of Diphtheria and 16 registered deaths, equivalent to an Attack-rate of 1·27, and a Death-rate of 0·30 per 1000 persons of all ages, the Case Mortality being 23·9 per cent. This Fatality is a high one (in London for the past year it was only 17·1 per cent. of notified cases,) and confutes the supposition that many cases of common sore throat were notified as Diphtheria; far more likely many cases of Diphtheria were not notified. There is naturally an unwillingness to notify any doubtful case. As regards Scarlet Fever, one particular court, Hat and Feather Yard, seems to have harboured the disease from season to season, but the Fatality has continued low. With Measles, Whooping Cough, and other Zymotic Diseases we have been more fortunate than most other towns or rural districts, and the low Mortality from Enteric or Typhoid Fever is the most pleasing feature of this Report. Even as regards Diphtheria our Attack-rate and Death-rate per 1000 persons are below those of London, and if our cases had been distributed more evenly over the city they would not have attracted so much attention, as they would not have been so manifestly preventable.

Zymotic Morbidity.

Cases Notified under the Infectious Disease Act.

	January	February	March	April	May	June	July	August	September	October	November	December	1897
Scarlet Fever ..	28	20	39	23	18	8	9	7	7	13	10	12	194
Diphtheria	2	4	9	5	9	4	4	—	6	5	9	8	65
Membranous Croup..	—	—	1	1	—	—	—	—	—	—	—	—	2
Typhoid Fever ..	1	—	—	—	—	1	3	1	—	1	1	4	12
Puerperal Fever ..	—	—	1	—	—	—	—	—	—	—	—	1	2
Erysipelas	8	7	5	5	7	2	5	2	3	5	2	8	59
Total	39	31	55	34	34	15	21	10	16	24	22	33	334
Removed	21	19	27	22	20	11	11	7	8	16	11	4	177

Zymotic Morbidity of 1897 compared with previous Quinquennium.

Year	Scarlet Fever	Diphtheria and M. Croup	Typhoid Fever	Puerperal Fever	Erysipelas	Total
1892	407	15	12	—	28 ...	462
1893	319	48	13	4	66 ...	450
1894	110	53	23	1	55 ...	242
1895	79	52	13	—	61 ...	205
1896	141	73	20	1	60 ...	295
Mean ...	211·2	48·2	16·2	1·2	54 ...	330·8
1897	194	67	12	2	59 ...	334

I cannot regard the figures given in the above tables as satisfactory, and a continued study of the methods employed in this City to combat disease has not led me to alter the opinions expressed in the Report for 1896, or in the Special Reports dated June 29th and September 21st of the same year. I must again respectfully draw your attention to the insufficient inspection of premises, and to the entire absence of any proper system of disinfection.

The results attained at the Statutory Hospital, as regards "Case Mortality," are in the highest degree admirable, but the establishments of small Wards for the observation of doubtful cases, and the use of bacterioscopic tests for cases of Diphtheria and Enteric Fever, would probably lead to the earlier discharge of many patients and a considerable saving in expense. Cases should not be sent into the General Wards until they had been seen by the Physician in charge. The circumstances under which many of the patients are seen in their homes are much less favorable to a correct diagnosis than those which obtain in a well-appointed Hospital.

A "Brougham Ambulance" is greatly needed. Many persons naturally object to our unsightly conveyance, and under present circumstances patients sometimes have to be removed after dark, or carried to the ambulance down a bye-street to avoid publicity. The ambulance should be kept in the city to facilitate removal.

Parochial Population and House Density.

Civil Parish.	Houses, 1891. Inhabited.	Uninhabited.	Building.	Population, Census, 1891. Males.	Females.	House Density, 1891.	Houses, 1897 Inhabited.	Uninhbtd
Bathwick	797	66	—	1,594	3,120	5·91	757	94
Lyncombe & Widcombe	2,581	161	36	6,344	7,426	5·33	2,711	162
St. James	614	52	—	2,025	2,733	7·75	645	26
St. Peter & St. Paul ...	234	83	—	686	982	7·13	302	9
St. Michael	342	88	1	820	1,215	5·95	442	16
Walcot	4,365	345	49	9,656	15,243	5·70	4,599	335
Bath, County Borough	8,933	795	86	21,125	30,719	5·80	9,456	642

This Return is based upon the Census for 1891, and on the Rate-book for April, 1897. Properties void for three months only are reckoned as half-voids.

Owing to the constant improvement in the social condition of the lower classes "house density" is becoming less year by year. This is shown in each succeeding Census, thus—1861, 6·552; 1871, 6·307; 1881, 5·924; and in 1891, 5·804. I estimate the house density for 1897 as 5·692, and for 1901 as 5·64. These are probably over estimates. In comparing the different parishes the difference in the size of the houses must not be overlooked In 1891 the rateable value of the houses in Bathwick averaged £48, while for Lyncombe and Widcombe the average was £22; both these localities are chiefly residential.

Sub-District Population, Death & Birth-Rates, 1897.

	Calculated Population.	Deaths. Male.	Deaths. Female.	Death Rate Crude.	Births. Male.	Births. Female.	Birth Rate
Walcot and City	33,600	273	309	17·3	335	299	18·8
Lyncombe & Widcombe	14,350	99	119	15·2	164	159	22·5
Bathwick	4,650	17	44	13·1	33	19	11·2
County Borough	52,600	389	472	16·4	532	477	19·2

Corrected District Mortality.

Usual Residence.	Where Dying: Private Dwelling.	Hospital.	Work-house.	Corrected Number.	Corrected Death Rate.
Walcot and City Parishes	472	54	47	573	17·1
Lyncombe and Widcombe	149	15	10	174	12·1
Bathwick	54	2	2	58	12·5
Rural Districts	12	40	9	61	

In this Table the errors due to the inclusion of Deaths in Public Institutions are, as far as possible, eliminated by distributing these deaths to the various Districts from which the persons were admitted. There were 96 deaths at the Royal United Hospital. Deaths at the Statutory Hospital are also included.

The Death-rates are not corrected to standard population, as the factors are unknown.

The percentage of Deaths in Public Institutions to total Deaths was 20·66.

Seasonal Crude Death-rates—Bath.

	Quarter. Winter.	Spring.	Summer.	Autumn.	Mean or Annual.
10 Years 1881-90	24·7	19·6	15·7	20·5	19·9
5 Years 1891-95	25·2	19·0	13·7	16·0	18·8
1896	17·5	15·6	16·3	18·8	17·2
1897	20·5	15·1	13·1	16·8	16·4
Maximum of 17 Years	31·2	26·4	18·9	26·5	22·6
Minimum do.	17·5	15·1	11·7	14·1	16·4

Seasonal Death-rate—England and Wales.

TOWN AND COUNTRY DISTRICTS COMPARED WITH BATH CORRECTED TO STANDARD POPULATION.

		Winter.	Spring.	Summer.	Autumn.	Annual.
5 Years 1891 to 1895	England & Wales	21·9	18·5	16·5	18·1	18·7
	Bath × 0·94 ...	23·7	17·9	12·9	15·0	17·6
	Town Districts...	25·2	19·1	17·6	19·0	19·5
	Country Districts	21·2	17·4	14·3	16·4	17·3
1896	England & Wales	17·9	16·3	16·3	17·9	17·1
	Bath × 0·94 ...	16·5	14·7	15·3	17·7	16·2
	Town Districts...	18·5	17·2	17·6	18·6	18·0
	Country Districts	16·6	14·5	13·7	16·3	15·3
1897	England & Wales	18·8	16·3	17·8	17·0	17·4
	Bath × 0·94 ...	19·3	14·2	12·3	15·8	15·4
	Town Districts...	18·9	16·6	19·4	17·9	18·2
	Country Districts	18·4	15·6	14·3	14·9	15·8

Quarterly Return of Births and Birth-rates.

	Births.	Winter.	Spring.	Summer.	Autumn.	1897
Bath ...	Legitimate ...	267	229	249	205	950
	Illegitimate...	11	17	15	16	59
	Total... ...	278	246	264	221	1009
	Rate per 1000	21·1	18·7	20·1	16·8	19·2
Eng. & Wales—	,, ,,	30·8	29·2	29·8	28·9	29·7

The Quarterly Returns were uniformly good, and call for no special comment, as I have already presented separate reports for each quarter.

The Water Supply.

Attention has this year been more than usually directed to the importance of safe-guarding public water supplies in consequence of various epidemics of Enteric Fever, and the Local Government Board have issued a special circular pointing out the duties of Governing Bodies in this matter.

Bath has an exceptionally good water supply derived from numerous springs. The upper springs are thrown out by the clays of the Fuller's Earth underlying the Great or Bath Oolite.

These springs are superficial, and responding readily to the rainfall vary greatly in their yield. The lower springs issue from the Upper Lias or Midford Sands, and are more constant. The progress of the Bath Waterworks was described in last year's Report by Mr. Gilby, C.E. Since then the Monkswood reservoir of 51,000,000 gallons capacity has been taken into use, which, with the Batheaston reservoir of 9,000,000 gallons and the smaller service reservoirs of Bathwick, Charlcombe and Lansdown, with an aggregate capacity of over 500,000 gallons, will probably ensure a constant service.

I have recently inspected the gathering ground in company with the Engineer. Most of the land is pasture land, but there are a few fields in cultivation and some scattered dwellings. The lower reservoir at Charlcombe is in proximity to a market garden ; it is seldom used and might be abandoned.

On account of the numerous sources it is not easy to give exact information concerning the mineral constituents of the water. But it is a moderately hard water, and those samples I have examined contain about 23 grains total solids per gallon, namely 16 grains calcium carbonate, 3 grains calcium or magnesium sulphates, about 2 grains of chlorine, about 1 grain of nitric acid as nitrates, traces of silicia, etc. The water is remarkably free from ammonia producing and deoxidizing substances.

In October, 1897, Mr. Gatehouse, F.I.C., Public Analyst for Bath, made analyses of water from four springs of the Charlcombe supply. The following were the results :—

Grains per gallon	I.	II.	III.	IV.
Chlorine as Chlorides	1·4	2·1	1·4	1·68
Free ammonia	None.	None.	None.	None.
Albumenoid ammonia	None.	None.	None.	None.
Total solids	24	28	21·3	25·6
Oxygen to oxidize decomposing matter	None.	None.	None.	None.
Nitrogen as nitrate	1·28	·82	1·11	·97
Equal to nitrogen	·28	·18	·24	·21
Hardness	14°	15·5	14°	16°5
Lead and poisonous metals	None	None.	None.	None.

Concerning each one he wrote:—This is a good drinking water. The chemical analysis does not indicate the presence of any pollution which could be injurious to health.

During the same month I made several quantitative bacterioscopic examinations of the water from the springs at Batheaston and Charlcombe. Flattened counting flasks were used for cultivations, and the micro-organisms fixed in the media within a few seconds of the samples being taken, thus avoiding the risk of multiplication before reaching the laboratory. I have also examined the water from the Monkswood reservoir as supplied to my own house.

The water from the springs at Batheaston was found to contain very few organisms, viz., from 4 to 16 per cubic centimetre (about 20 drops), and these were, I have reason to think, mostly picked up during transit through the pipes. The excellent filtering qualities of the Midford Sands, which in the neighbourhood of Bath vary from 40 to 150 feet in thickness, account for this result; but in some places the surface water would only pass through a few feet of these Sands. In water taken from the reservoir I have obtained as many as 300 colonies of harmless micro organisms per c.c.—a result which is quite compatible with absolute purity. In water from the main at my own house I have at different times found from 50 to 80 microbes per c.c., the water having travelled some seven miles in iron pipes. The samples were incubated for from three to five days. It is characteristic of pure water that the rapid increase which takes place on first exposure in the reservoir is followed by a rapid decrease, whereas in impure waters the microbes continue to multiply for some days.

Sir E. Frankland, reporting on the New River Water, which is one of the best of London supplies, gives the number of microbes per cubic centimetre on September 9th as follows:—Before passing through reservoirs, 2,200; after passing, 1,260.

For the filtered water, as supplied from the different filters, from 12 to 80 microbes per cubic centimetre. The Kent Company's "New" Well at Deptford, for September 10th, only yielded 4 microbes per cubic centimetre, after incubation for from three to five days.

Quantitative bacterioscopic examinations of water are of value when a series of such examinations is made, for superficial springs yield water which has been more or less efficiently filtered, just as the water which has passed through artificially prepared sand filters may be more or less efficiently freed from microbes. A qualitative bacterioscopic examination for specific disease organisms can, as a rule, only serve as evidence after mischief has been done.

Probably the best evidence of the purity of the Bath water supply is found in the absence of water borne disease. This City, with 52,000 inhabitants, has a record for the decennium 1881-90 of 5 deaths per annum, and for the past seven years of 3 deaths per annum from Enteric or Typhoid Fever, some of which were deaths of patients brought into Bath for treatment at the Royal United Hospital when suffering from this disease.* This is better evidence than can be furnished by Chemist or Bacteriologist. We must none-the-less zealously protect from pollution that which Nature has given us so pure. The Medico-chemical Expert and the Engineer should act together, and be jointly responsible for the protection of the water supply.

Sewage Disposal.

The disposal of our sewage is almost entirely by "water carriage" into the river, and plans for its previous treatment are still under consideration. We cannot yet boast of an unpolluted stream. The time seems rapidly approaching when a recognized economical and satisfactory process will leave no excuse for further delay.

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* The normal number of deaths from Typhoid in such a population is 12 persons per annum.

I have visited several Sewage Works during the year, and have carefully followed the experiments connected with Mr. Cameron's modification of the Scott-Moncrieff system for the bacteriological purification of sewage, as carried out at Exeter, and have taken samples of the Exeter effluents both in wet and dry weather, in order to ascertain if secondary fermentations of objectionable character occurred. I have compared these samples with those from various Works where chemical processes are used, and find the Exeter effluents, when the filters are in good working order, everything that can be desired, but I am not by any means sure that the "Septic Tank" is an essential feature in the economical treatment of sewage by bacterial methods. The experiments with "living filters," now being tried at Leeds and elsewhere, will be watched with interest, and some such experiments undertaken in Bath might save a considerable expenditure in the future.

Disinfection.

The Report which I presented on this subject immediately upon my appointment, was not finally considered until 1897. The Sub-Committee decided that it was unnecessary to adopt any of the alterations I suggested. No doubt this was in a great measure due to the extensive character of the changes proposed. I was asked to prepare a complete scheme, and did so, the plan suggested would be cheaper than our present method.

I crave permission to again refer to this matter. From the "Abstract of the Accounts of the Treasurer of the City of Bath," the average cost for "disinfecting" for the seven years preceding 1896 was £501 17s. 4d. For the year 1896 it was £462 1s. 11d. This sum was made up as follows—Disinfecting Fluid and Powder, £178 3s. 7d.; Sanitas, £61 14s. 10d.; Sulphur Dioxide, £5 8s.; Mr. Hayman's Account, £179 7s. 6d.; Mr. Book for carrying, £37 8s.

From inquiries which I have made in other towns of about the same population as Bath, I cannot find that any such amount is spent in disinfectants, and I would respectfully suggest a reconsideration of the methods of disinfecting and distributing disinfectants. Formerly, large quantities were used on the banks of the river, but none during the past eighteen months, and I venture to think the City Surveyor, assisted by the heavy rainfall of the past year, has done more to improve the condition of the river than could ever have been effected by "disinfecting powder." As regards disinfecting clothing and bedding after infectious disease, steam is the best agent to employ. The method at present adopted does not kill flies, spiders or common parasites, and is more expensive than disinfection by steam.

Inspections made during 1897.

COMMON LODGING HOUSES.

There are seven Common Lodging Houses in Avon Street, registered to accommodate 162 persons. I have inspected them twice during the year and have found them clean and well kept. The cubic space in some rooms is just under 300 cubic feet per person. To insure more thorough ventilation all windows have been made to open by the upper sashes as well as the lower. It is unfortunate that in many other houses not so directly under our control the upper sashes are fixed, but gradually, I hope, this defect will be remedied.

CARAVANS, VANS, ROUNDABOUTS, &c.

Nuisances are occasionally complained of in connection with the assemblage of these adjuncts to youthful enjoyment. The law in respect to nuisances is the same for vans as for houses, but owing to their temporary location, it would be better to make Bye-laws which would aid in preventing nuisances rather than to trust to Statutes which only enable us to demand their abatement.

" A Sanitary Authority may make Bye-laws for promoting cleanliness in, and the habitable condition of tents, vans, sheds and similar structures used for human habitation, and for preventing the spread of infectious diseases by the persons inhabiting the same, and generally for the prevention of nuisances in connection with the same."

HOUSE INSPECTION.

In consequence of the prevalence of Diphtheria in Larkhall, a house to house inspection of a portion of this district was this year carried out under the direction of the City Surveyor. Back Lane, Brookleaze Buildings and Place, Brooklyn Road, Budbrook Place, Catsley Place, Cottage Place, Dafford Street, Eldon Place, Larkhall Terrace, Otago Terrace, Rose Hill and Rose Terrace came under this survey, and for 333 houses about 300 notices were served in connection with drainage alone. Only the grossest defects were noticed, no attempt was made to properly ventilate the drains. The Inspector of Drainage, acting under the Surveyor, did all he could to supervise this work, which was additional to his ordinary duties.

I reported Nos. 2, 3, 4 and 5, Brookleaze Place and No. 9, Catsley Place as unfit for human habitation, and for these five houses a specification of the work proposed to be done has since been submitted, which, if properly carried out, will effect a permanent improvement.

Within the City I have also similarly reported Nos. 1, 2, 3 and 4, Hen and Chicken Court, and I hope these wretched houses are now permanently closed if not demolished.

Unless more work of this character is undertaken Bath will be much behind other similar cities as regards sanitary progress. At the present time voluntary improvements with regard to drainage are not officially supervised unless the connection with main sewer is to be disturbed. Even where supervision is asked for it is refused. Persons coming to

Bath, willing to pay for inspection of houses, are referred to a tradesman.

THE HOUSING OF THE WORKING CLASSES.

It is unnecessary for me to give any particulars concerning the Housing of the Working Classes Act, as a Special Committee considered its application to Bath in 1894. So far very little has been done to give effect to its regulations. But, as 17 Artizans' Dwellings have been demolished recently in the Dolemeads it will be necessary to replace them by such a number as the Local Government Board may direct before a loan can be obtained for the River Improvement Scheme. The late Medical Officer of Health repeatedly called attention to the necessity for more sanitary houses at low rentals. I may refer to his Reports for 1889 (page 12), 1890 (page 13), 1891 (page 15), 1893 (page 18), and particularly to his Report for 1894 (page 17), where he says:—"My attention has been directed to the possibility of improvement of house property in the Dolemeads by compulsory measures. . . . What is to become of the 'evicted tenant?' They would go to 'overcrowd' tenements just as bad in other parts of the City, and 'the last state would be worse than the first.' I have no hesitation in saying, with all due respect, after an experience of 18 years, that the first step necessary toward the improvement of the 'Housing of the Working Classes,' and before condemning house property as unfit for habitation, is to provide healthy houses at moderate rental for those who would be unhoused by the process of law."

Dr. Brabazon's opinion coincided with that of most officials who have been brought face to face with this great social problem. Some of the larger Corporations, notably those of Liverpool and Glasgow, have attempted to grapple with it, and with much success. When private philanthropy comes to the aid difficulties vanish; it seems difficult otherwise to provide houses at the rate of "a shilling per week per room," and these are what are wanted.

LAMBRIDGE BROOK.

Special attention has been given to this Brook during the year. The drains from Lambridge Mill, and from some houses in the Rural Districts, have been cut off. Its condition is much improved, but the Bailbrook Sewer still enters near the London Road, and may give rise to a nuisance in the summer.

SCHOOL INSPECTION.

In consequence of the outbreak of Diphtheria in the autumn quarter of 1896 among children of school going age, the Sanitary Committee ordered an inspection of all Elementary Schools, including 17 Church Schools and 4 Board Schools. The inspection was supervised by the City Surveyor, and improvements, more or less extensive in character, where found to be needed in all but three schools. On January 25th, 1897, the Surveyor reported the work as well in hand.

It is interesting to be able to say that no school this year has been closed by my advice, and also that the average attendance is a record one, viz., 84·6 per cent. The following being previous averages—1872-80, 72·97; 1881-90, 75·55; 1891-95, 78·64; 1896, 83·1. No doubt the improvement in attendances is chiefly due to the three officers whose duty it is to look up absentees.

OFFENSIVE TRADES.

Very few offensive trades are carried on in Bath, but there are a few, and these require more systematic inspection of premises.

In my Report upon Parsons' Yard Slaughter-houses, I referred particularly to the gut scraping establishment connected therewith. Subsequently the lessee offered to surrender his lease for this part of the property, including four Slaughter-houses, for the sum of £150 and a reduction of ground-rent of £10 a year. I regret that the opportunity for closing these undesirable premises was lost.

I also reported upon the existence of a nuisance in connection with a Rag and Bone Merchant's premises, to which my attention was called by H M. Inspector of Factories and Workshops. That a heap of rubbish was allowed to accumulate for over four years will help to show the necessity for appointing an Assistant-Inspector.

SMOKE NUISANCES.

Bath is certainly not a city one is likely to have much to report under this heading, but, by Resolution of the Sanitary Committee, March 22nd, I was requested "To enquire into and report as to the nuisance arising from the Destructor, which is complained of by the inhabitants of the upper part of the town and the visitors to the Royal Victoria Park." On April 20th I reported "That in my opinion there is no nuisance from this source within the meaning of Section 91, P.H.A., 1875, and that the vapours from the Destructor were remarkably free from dust, and in no way injurious to health."

SLAUGHTER HOUSES.

In 1867 the late Dr. Barter presented a Report to the Board of Health upon these establishments, and his report for the year 1868 says:—"It is a matter of regret that any slaughtering takes place in the city. In several towns in England the Slaughter-houses are abolished and Public Abattoirs erected out of the town. This is so in the case of Weston-super-Mare, Newport (Mon), Reading, and Plymouth, and I hope the day is not far distant when the good example set by these towns will be followed by the city of Bath." Thirty years have passed, but this hope is still unfulfilled, though very many towns might be added to Dr. Barter's list. I will only mention two somewhat similar to Bath, viz., Cheltenham and Exeter. The Medical Officer of Health of the latter city in his report for 1895 writes :—The Public Abattoir has been regularly inspected and is kept in a high state of efficiency, and is much appreciated by the majority of the butchers in the city."

There are 46 licensed Slaughter-houses in Bath, of these 10 are said to be discontinued, and 4 void, so there appear to be 32 in actual use. I have visited nearly all these and am convinced that nothing but a Public Abattoir under proper supervision will cure the evils which exist. Did the public know the conditions under which animals are kept and slaughtered, and the meat stored for hours before being taken to the shops, it would not be long before the present methods were abandoned. Experience teaches us that those engaged in the trade will not reform unless some pressure is brought to bear. I cannot avoid thinking that many Butchers do not realize the revolting details of their own Slaughter-houses.

BAKEHOUSES.

In the Report for 1896 I gave some particulars concerning recent legislation relating to Bake-houses. Certain duties previously supposed to be discharged by H.M. Inspector of Factories and Workshops are now to be undertaken by the Medical Officer of Health. This does not relieve the Inspector of Nuisances of his duties under other Statutes and Bye-laws, and in a large city it would be obviously impossible for the Medical Officer of Health to personally undertake the supervision even of the structural arrangements.

I have endeavoured to make myself acquainted with the condition of the Bake-houses of Bath, and have inspected 67. I found that 27 failed to comply with the regulations of the Factory and Workshops Acts of 1895 and 1883. Most of the defects were due to covering in and using as a Bake-house what was formerly an open yard or area, and so including gullies and other openings connected with drains. I have pointed out to the occupiers the required alterations; where absolute disconnection cannot be obtained I recommend properly ventilated inspection chambers. As a rule the work was promised to be done, and in some Bakehouses I know extensive alterations have been made. I hope shortly to make a second inspection, and shall then serve formal notices, but as most of the Bakers seemed anxious to put their Bake-houses in order I thought it unnecessary to do this in the first instance, as with our present staff it is difficult to see them carried out.

DAIRIES, COWSHEDS, AND MILKSHOPS.

The General Inspector of Nuisances was specially appointed Inspector under the Dairies, Cowsheds, and Milkshops Order, 1885. He keeps a Register and report inspections as having been made.

There appear to be 12 Farms and 24 other Dairies, and several milkshops in Bath. I have commenced an inspection. The milkshops as a rule are well kept, being exposed to public view. Dairies are also generally in good order, but I should like to see better provision made for storing the milk cans when not in use, and for daily steaming them; steam can easily be generated on the small scale without much expense. Some of the Cowsheds are models of what may be fairly expected, while in others no attention seems to have been paid to Article 8 of the Order, which is intended to regulate the sanitary state of all Dairies and Cowsheds, whether occupied at the commencement of this Order or not. The Cowsheds vary in air space from 300 to 800 cubic feet per cow, and the arrangements for lighting and ventilating are sometimes very inadequate.

The recent epidemic of Enteric Fever at Clifton was attributed by the Medical Officer of Health of Bristol to insanitary conditions in one of the Farms from which the milk supply was obtained. This accentuates the importance of proper inspection, particularly of those Cowsheds situated in Rural Districts which are less under observation than those in Urban Districts.

EXPOSURE OF INFECTED PERSONS.

I have had occasion during the year to report an offence under the Infectious Disease (Notification) Act. The offender was a small tradesman in one of the main thoroughfares. His child was seen by a medical man and declared to be suffering from scarlet fever. The usual notification form was filled in and given to the mother to send to the office. This the mother wilfully neglected to do. The father "did not wish to have the ambulance outside his shop as it might frighten his customers," and the child was taken to the Royal United Hospital, where it was kept for some time among the other out-patients awaiting its turn. As soon as the child was seen by the medical officer scarlet fever was recognized, and the child was isolated and notified. The previous facts coming to my knowledge I reported them to the Sanitary Committee, and a prosecution was ordered. By the advice of the Clerk proceedings were taken under the Public Health Act of 1875, and the mother was fined 20s.

In accordance with Section 14 of the Infectious Disease (Prevention) Act, we now give notice of the penalties incurred by failure to notify, exposure of infected persons or things, etc., to the occupier of any house in which we know there is a person suffering from a dangerous infectious disease.

Conclusion

In conclusion, I think we may regard the year 1897 as a satisfactory year compared with other years. In making comparisons with standards it is necessary to remember that they were fixed for the decennium 1881-90, and that since then death rates have fallen generally throughout England and Wales. For 1897 instead of 19·15 per 1,000 annually from all causes, the death-rate was 17·4 for England and Wales. In 1896 it was 17·1 for England and Wales, and there were eight towns of greater populations than Bath with a death-rate under 14 per 1,000 annually.

I respectfully suggest for your consideration the necessity for modern Bye-laws regulating old and new buildings, houses let in lodgings, trades concerned with the food supply and disposal of refuse. The appointment of an Assistant Inspector, preferably one who has had experience in another large town, who will give his whole time to inspecting and work in concert with me. The provision of a steam disinfector.

I beg to thank the Sanitary Committee for their courtesy and kindness to me, and also the Officials for the assistance they have given me.

It is hardly necessary to say that my medical confrères render invaluable aid, without which little could be done to prevent disease. I gladly take this opportunity of thanking them.

Trusting the Urban Sanitary Authority may feel satisfied with the manner in which I have tried to discharge my duties,

I remain,
Their obedient Servant,
W. H. SYMONS,
Medical Officer of Health.

"Hampstead,"
Combe Park,
Bath.
February 19th, 1898.

BATH URBAN SANITARY DISTRICT.

Deaths from all Causes during the Year 1897, classified according to Diseases, Ages and Sub-Districts.

Causes of Death.	Under 1 Year.	1 to 5.	5 to 15	15 to 25.	25 to 65.	65 to 80.	80 and over.	Walcot and City.	Lyncombe and Widcombe.	Bathwick.	Non-resident.	Male.	Female.	Total.
I. SPECIFIC, FEBRILE OR ZYMOTIC DISEASES.														
1. Miasmatic Diseases.														
Measles	2	8	1	..	..	..	..	7	3	..	1	8	3	11
Scarlet Fever	..	..	1	..	..	..	..	1	..	..	..	1	..	1
Influenza	..	..	..	..	5	2	5	7	3	2	..	5	7	12
Whooping Cough	7	7	1	..	..	..	..	8	5	2	..	7	8	15
Diphtheria aud Membranous Croup ...	3	8	3	..	1	..	..	12	3	..	..	7	8	15
Enteric or Typhoid Fever	..	..	..	..	3	..	..	3	..	..	..	3	..	3
2. Diarrhœal Diseases.														
Diarrhœa	7	2	..	..	1	2	..	6	3	2	1	8	4	12
Gastro-enteritis	4	..	..	..	..	1	..	4	..	1	..	3	2	5
5. Venereal Diseases.														
Syphilis Hereditary	13	..	..	..	..	..	..	10	2	..	1	7	6	13
6. Septic Diseases.														
Erysipelas	..	..	..	..	1	1	..	1	1	..	..	1	1	2
Pyæmia, Septicæmia	..	..	..	..	2	..	..	2	..	..	..	1	1	2
Totals	36	25	6	..	13	6	5	61	20	7	3	51	40	91
IV. CONSTITUTIONAL DISEASES														
Gout	..	..	..	..	1	2	..	2	1	..	..	3	..	3
Caucer, Maliguant Disease	..	..	1	..	36	26	2	42	16	4	3	21	44	65
Marasmus	4	..	..	..	..	..	..	4	..	..	..	4	..	4
Tabes Mesenterica	1	3	..	..	..	..	..	3	1	..	..	2	2	4
Tubercular Meningitis, Hydrocephalus ...	1	2	..	1	..	..	..	4	..	..	..	2	2	4
Phthisis	..	2	2	12	46	2	..	45	15	2	2	32	32	64
Other forms of Tuberculosis, Scrufula ...	4	3	3	2	2	..	..	8	3	..	3	8	6	14
Anæmia, Chlorisis, Leucocythæmia	..	..	1	..	1	2	..	4	..	..	..	2	2	4
Glycosuria, Diabetes Mellitus	..	..	1	2	2	3	..	5	1	2	..	4	4	8
Totals (including 2 others) ...	10	12	8	17	88	35	2	117	38	8	9	80	92	172
V. DEVELOPMENTAL DISEASES.														
Premature Birth	20	..	..	..	..	..	..	15	5	..	..	7	13	20
Congeuital Malformations	3	..	..	..	..	..	..	1	2	..	..	2	1	3
Old Age	..	..	..	..	2	8	27	28	5	4	..	14	23	37
Totals	23	..	..	..	2	8	27	44	12	4	..	23	37	60
VI. LOCAL DISEASES.														
1. Diseases of Nervous System.														
Inflammation of Brain or Membranes ...	2	1	1	..	6	1	2	6	3	..	4	9	4	13
Apoplexy, Softeniug of Brain	..	..	1	..	16	18	8	24	10	5	4	19	24	43
Hemiplegia, Brain Paralysis ...	..	..	..	..	5	12	1	13	2	1	2	7	11	18
Epilepsy	..	..	..	..	2	2	..	4	..	..	..	1	3	4
Convulsions	13	2	1	..	..	..	..	15	1	..	..	8	8	16
Disease of Spinal Cord, Paraplogia ...	..	..	..	..	4	4	..	5	2	1	..	2	6	8
Peripheral Neuritis	..	..	..	..	3	..	..	2	..	..	1	1	2	3
Totals (including 2 others) ...	16	3	3	..	36	38	11	71	18	7	11	47	60	107
2. Diseases of Organs of Special Sense.														
Middle Ear	..	..	3	1	2	..	..	2	3	..	1	5	1	6
3. Diseases of Circulatory System.														
Diseases of Heart	..	..	..	1	35	51	18	71	15	10	9	36	69	105
Diseases of Blood Vessels, Gangrene ...	..	..	..	..	9	2	2	9	2	2	..	6	7	13
Totals	..	..	..	1	44	53	20	80	17	12	9	42	76	118
4. Diseases of Respiratory System.														
Laryugitis	..	..	2	..	..	..	..	2	..	..	..	..	2	2
Bronchitis	15	11	..	..	24	33	15	53	32	6	7	46	52	98
Pneumonia	6	10	3	2	20	7	4	34	9	4	5	26	26	52
Inflammation and Congestion of Lungs ...	..	2	..	..	2	3	..	4	3	..	..	3	4	7
Pleurisy	..	..	..	1	..	1	..	1	1	..	..	1	1	2
Totals	21	23	5	3	46	44	19	94	45	10	12	76	85	161
5. Diseases of Digestive System.														
Diseases of Stomach	1	..	..	..	..	1	1	3	..	..	..	1	2	3
Enteritis	3	..	..	..	1	1	..	3	..	1	1	1	4	5
Obstructive Diseases of Intestine ...	..	..	..	..	3	5	3	7	3	..	1	4	7	11
Peritonitis	..	..	2	1	2	..	..	3	1	..	1	4	1	5
Cirrhosis of Liver	..	..	..	1	11	6	..	15	2	1	..	8	10	18
Other Diseases of Liver	..	..	..	..	3	..	..	3	..	..	..	2	1	3
Totals (including 2 others) ...	4	..	2	2	20	14	5	36	6	2	3	20	27	47
8. Diseases of Urinary System.														
Nephritis	..	..	1	2	3	6	..	8	1	1	2	5	7	12
Brigbt's Diseases, Albuminuria	..	..	..	..	7	4	2	7	4	1	1	6	7	13
Disease of Bladder or of Prostate ...	..	..	..	..	1	1	2	3	..	..	1	2	2	4
Totals	..	..	1	2	11	11	4	18	5	2	4	13	16	29
9. Diseases of Reproductive System.														
Organs of Generation	..	..	..	..	4	1	1	4	..	1	1	..	6	6
Partuition	..	..	..	..	2	..	..	2	..	..	..	..	2	2
Accidents of Childbirth	..	..	..	..	1	..	..	..	1	..	..	..	1	1
Totals	..	..	..	..	7	1	1	6	1	1	1	..	9	9
VII. DEATHS FROM VIOLENCE.														
1. Accident or Negligence.														
Fractures and Contusions	..	1	1	4	4	3	1	7	1	2	4	8	6	14
Drowning	..	..	..	1	1	1	..	2	..	1	..	2	1	3
Suffocation	3	..	..	..	1	..	..	4	..	..	..	2	2	4
Burns and Scalds	..	5	..	..	..	1	..	2	1	..	3	3	3	6
2. Homicide	1	..	..	..	1	..	..	2	..	..	..	2	..	2
3. Suicide.														
Cut, Poison, Drowning, and Hanging ...	..	..	..	..	5	1	..	5	..	..	1	4	2	6
Total (including 1 Negligence)...	4	6	2	5	12	6	1	23	2	3	8	21	15	36
VIII. DEATHS FROM ILL-DEFINED AND MISCELLANEOUS CAUSES.														
Debility, Atropby, Inanition	15	..	..	..	1	..	..	12	3	1	..	7	9	16
Miscellaneous	..	..	1	2	2	1	1	4	2	1	..	3	4	7
Not Certified	..	..	1	..	..	1	..	1	1	..	..	1	1	2
Totals	15	..	2	2	3	2	1	17	6	2	..	11	14	25
Total all ages 861, viz.:	129	69	32	33	284	218	96	569	173	58	61	389	472	861

Sanitary and General Inspectors Report,

For the year ending December 31st, 1897.

280	Offensive Privies, Drains, etc., abated by Structural Works.
230	Premises Disinfected after Infectious Disease.
140	Premises Cleansed and Whitewashed after notice.
20	Accumulations of Dung from the keeping of Animals removed after notice.
4	Smoke Nuisances abated after notice.
13	Overcrowding abated after notice.
7	Nuisances from Pigs abated after notice.
2	Samples of Water tested and found Impure.
1	Sample of Water tested and found Pure.
9	Premises Inspected previous to Registration under Dairies Act.
2	Selling Milk in contravention of Dairies Act.
7	Water supply for domestic purposes disconnected from w.c. cisterns.
7	Nuisances in Slaughter Houses abated.
40	Accumulations of Ashes in houses and yards Removed after notice to Surveyor.
333	Houses inspected specially.
20	Other Nuisances abated without Structural Works.
134	Samples obtained under Sale of Food and Drugs Act. 133 genuine, 1 not genuine.

Inspections have taken place of the Statutory Hospital, Slaughter-houses, Dairies, Canal Boats, Common Lodging Houses, Hackney Carriages, Wheel Chairs, &c.

H. GRAHAME MONTAGU,

Sanitary and General Inspector.

Municipal Offices,
Bath.

STATUTORY HOSPITAL.

RURAL.

Patients admitted from Jan. 1st to Dec. 31st, 1897.

30 Scarlatina.

8 Diphtheria.

DEATHS.

No death from Rural Patients.

URBAN.

Patients admitted from Jan. 1st to Dec. 31st, 1897.

152 Scarlatina.

27 Diphtheria.

DEATHS.

4 Scarlatina.

1 Diphtheria.

RURAL & URBAN COMBINED.

217 Patients admitted from Jan. 1st to Dec. 31st, 1897.

182 Scarlatina.

35 Diphtheria.

DEATHS.

4 Scarlatina.

1 Diphtheria.

H. GRAHAME MONTAGU,

Superintendent.